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**University Examinations 2016/2017**

FOURTH YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE PHYSICS

**SPH 2409: APPLIED GEOPHYSICS**

**DATE: December, 2016 TIME: HOURS**



**INSTRUCTIONS:** *Answer questions* ***one*** *and any other* ***two*** *questions.*

**QUESTION ONE - (30 MARKS)**

1. (i) State the sources of Terrific currents. (1Mark)

(ii) Explain the significance of “apparent wavelength” as applied in exploration.(3 Marks)

1. Describe the electric field of the earth. (4 Marks)
2. Differentiate between the two methods of electrical surveying. (4 Marks)
3. Briefly describe regional anomalies as applied to gravity surveying. (5 Marks)
4. (i) Define magnetization of a material. (1 Mark)

(ii) Sketch the magnetization curve of a paramagnetic and a diamagnetic material on the same axis. (4 Marks)

1. Define paramagnetic curie temperature. (1 Mark)
2. Draw and label Ternary diagram of Titanium and Iron oxides. (5 Marks)
3. State the implications of low resistivity masses underground. (2 Marks)

**QUESTION TWO (20 MARKS)**

1. Describe magnetocrystalline anisotropy with the aid of diagrams with reference to cobalt. (10 Marks)
2. The weight of a rock sample was found to be 600g in air and 480g when weighed in water. Calculate the density of the rock. Given that the density of water is 1g/cm3.

(4 Marks)

1. Explain how boundary layer under the surface of the earth can be detected using reflection seismology. (6 Marks)

**QUESTION THREE (20 MARKS)**

1. Describe the procedure used in Bore hole gravimetry with the aid of a well labeled diagram. (8 Marks)
2. Describe clearly the two methods used in self potential surveying indicating their advantages and disadvantages. (12 Marks)

**QUESTION FOUR (20 MARKS)**

1. Explain how terrulic currents are produced. (8 Marks)
2. Explain how a seismometer works. (6 Marks)
3. In borehole gravimetry two valves of gravity were obtained as follows;

At a depth of 300m, g = 980000.1mgal

At a depth of 600m, g= 980000.15mgal

If the combined elevation correction is 0.3086 – (0.04293 x ) correction is (0.04193 x ) Find the density of rocks. (6 Marks)